BROADCAST tools INC

Installation and Operation Manual

SS 4.1 III

Four Input, Single Output Stereo Switcher/Router

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INTRODUCTION

Thank you for your purchase of a Broadcast Tools® SS 4.1 III, Four Input, Single Output Stereo Switcher/Router (referred to as the SS 4.1 III throughout this manual). We're confident that this product will give you many years of dependable service.

This manual is intended to give you all the information needed to install and operate the Broadcast Tools® SS 4.1 III, Four Input, Single Output Stereo Switcher/Router.

SAFETY INFORMATION

Only qualified personnel should install Broadcast Tools® products. Incorrect or inappropriate use and/or installation could result in a hazardous condition.

WHO TO CONTACT FOR HELP

If you have any questions regarding your product or you need assistance, please contact your distributor from whom you purchased this equipment.

If you would like more information about Broadcast Tools® products, you may reach us at:

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THANK YOU FOR CHOOSING
BROADCAST TOOLS® BRAND PRODUCTS!

CAUTION!

Broadcast Tools® Products, as with any electronic device, can fail without warning. Do not use this product in applications where a life threatening condition could result due to failure.

NOTE:

This manual should be read thoroughly before installation and operation.

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PRODUCT DESCRIPTION

The SS 4.1 III passively switches or routes a variety of electrical signals to a destination. The SS 4.1 III selects any one of 4 stereo inputs to a single stereo output. The SS 4.1 III provides PASSIVE switching through gold contact relays. The passive switching means that the unit can route a signal in both directions (any one of 4 stereo inputs to a single destination, or a single source to any one of 4 destinations). Due to the passive nature of the switching, any input level and impedance can be used. Inputs may be balanced or unbalanced, while output levels, impedance, distortion, noise and balancing will match that of the selected input. In addition to their normal use with audio signals, the unit can also be used to switch digital signals and telephone lines.

The SS 4.1 III is controlled by means of front panel switches, contact closures, 5-volt TTL/CMOS logic levels and/or a multi-drop serial port.

The SS 4.1 III has several unique features. The Power-Up feature allows the user to select which of any source is active at power up, including the last source selected. Audio mute allows the user to turn off the audio output when activated. A Step Input provides a means of stepping though each source, including MOH Station Selection. A Serial Port allows communication and operation from a computer's serial port. Source number one is configured by default to route audio to the output in the case of loss of power to the unit. Non-selected sources are terminated with 10K W, load resistors.

APPLICATIONS

Some of the applications of the SS 4.1 III; Studio selection and routing; Audio processing select; Exciter input select; Remote broadcast input selection; STL source selection; Automation source selection; Multiple station Music On-Hold and/or PA switching; EAS audio switching; ISDN or Phone hybrid feed selection; IFB selection; Satellite audio channel switching and console monitor inputs and outputs selection.

FRONT PANEL DESCRIPTION

Source Switches:

Each switch represents an input to be routed to the switcher's output. High quality tactile switches will give the user years of dependable service. Each switch has an associated LED indicator, which will illuminate when that particular source is routed to the output. When a source is selected, the previous source will be deselected, (interlocked). The front panel is also equipped with a MUTE switch. This switch turns off the audio output.

LEDs:

LED indicators will illuminate when the desired channel is selected. The Pwr/Ser LED displays valid power and serial data activity. The mute LED denotes when audio is off.

REAR PANEL DESCRIPTION

The rear panel contains the inputs, outputs and remote control interfacing connectors. Audio inputs, outputs and remote control connections are pluggable screw terminals. A RJ-11 modular jack is provided for the multi-drop serial port.

Power:

Connect the 2.1mm coaxial type power connector into the unit and the 9 VAC @ 1 amp wall transformer into a 120 Vac 50-60 Hz power source. The front panel Pwr/Ser LED indicates when power is applied to the unit. (CE 220 Vac 50-60 Hz wall transformer OPTIONAL)

Audio Signal Connector:

The SS 4.1 III is supplied with Pluggable Screw terminals (Euro) and Mating connectors. Channel and polarity designators can be found on the chassis, as viewed from the rear.

"Remote" Control Connector:

Pluggable Screw terminals (Euro) and mating connectors are provided for connection to equipment, which will remotely control the SS 4.1 III. Pulsing the "MUTE" input to ground (low) would turn off the output of the SS 4.1 III until a front panel source switch is pressed, a remote control input is activated or the unit is powered up. Pulsing the "STEP" input to ground will step the unit one source for each low to high transition on this input. Automatic sequence may be accomplished by holding the step input low for two seconds. The unit will now step to each source every 50 seconds. The step input is helpful in freeing up valuable remote control channels. This feature may also be used to sequence through multiple station air monitor signals for program on-hold feed.

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INSTALLATION GUIDELINES

It is recommended that all cables connected to the SS 4.1 III be looped through ferrite cores to suppress RF. Surge protection with RF filtering such as the Tripp Lite "ISOBAR 4" is also suggested for the power transformer. The purchase of an inexpensive uninterruptible power supply (UPS) will provide back up in case of power outages.

The SS 4.1 III is simple to install. Connections are via pluggable screw terminals. Installation of the SS 4.1 III consists of seven steps:

1. Inspection
2. Removal of the source termination resistors, if applicable
3. Bench test and option set-up
4. Mount the unit in a rack (RA-1), desktop or wall
5. Connect your equipment to the unit
6. Label the front panel switches
7. Serial operation, if applicable

STEP 1: INSPECTION

Please examine your SS 4.1 III carefully for any damage that may have been sustained during shipping. If any is noted, please notify the shipper immediately. Retain the packaging for inspection by the shipper. The package should contain the SS 4.1 III, this manual, 9 VAC @ 1 amp transformer, reversed modular cable, 9-pin (S9) D-Sub adapter and audio and remote control mating connectors.

STEP 2: SOURCE TERMINATION RESISTOR REMOVAL

Input sources that are not selected are terminated with a 10K W. If you do not want this load applied across the deselected sources, it may be removed from each channel. Each channel has a pair of resistors.

EXAMPLE: Channel 1, relays K1 A&B switches the signal; R15 & R21 are the load resistors. As delivered, all channels are configured with these resistors installed. To remove the load resistors from a channel, locate via the schematic the proper resistors for that channel, cut its leads and discard the resistors.

STEP 3: BENCH TEST and OPTIONS

Place each unit on a workspace and connect power to the unit. Check to see if LED #1 (Switch 1) and the Pwr/Ser LED are lit (Source one is the power-up factory default). Connect an audio source to stereo input one and a monitoring device to the output. Verify that audio is present. Repeat the process until each channel's operation has been verified.

CAUTION!

Installation of the SS 4.1 III in high RF environments should be performed with care. Shielded cable is suggested for all control, audio inputs and outputs. All shields should be tied to the "CH GND" terminal on each channel. The station ground should be connected to the chassis ground screw (CH1) located behind J1 as viewed from the rear. For lightning protection, check out www.polyphaser.com and www.itwlinx.com.

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DIP (SW - 6) Switch Functions

Unit ID	SW6-1	SW6-2
ID 0 *	OFF	OFF
ID 1	ON	OFF
ID 2	OFF	ON
ID 3	ON	ON

Baud Rate	SW6-3	SW6-4
2400	ON	OFF
9600 *	OFF	OFF
19200	OFF	ON
38400	ON	ON

* = Factory setting

SW6-5 **OFF = Last source selected ***
ON = Power up selection

SW6-6 **OFF = Normal operation ***
ON = Act as a SS 2.1 switcher/Router

Input selection at power-up may be determined by holding down the desired channels push button until all LED's flash. Factory power-up default is source # 1.

STEP 4: MOUNTING

Mount the unit in a rack or desktop, allowing adequate airflow for cooling.

STEP 5: CONNECT YOUR EQUIPMENT

The SS 4.1 III interfaces to your equipment (sources and loads) through the rear panel pluggable screw terminals. Follow the legends for the desired audio input, output and remote control connections, which appear on the rear side of the chassis. Remove each screw terminal, strip each conductor, and insert the conductor into the terminal and screw down the capture screw. The terminals accommodate wire sizes from 16 - 28 AWG solid or stranded wire.

STEP 6: LABEL SWITCHES

Write the source descriptions under each source switch, if desired.

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STEP 7: SERIAL OPERATION

The supplied reversed modular cable and 9-pin (S9) D-sub adapters may be connected to the SS 4.1 III's rear panel modular connector. Plug in the D-sub adapter into your computer's serial port. Plug the supplied wall transformer into a source of 117 vac and the cable end of the transformer into the power receptacle on the SS 4.1 III. The protocol is as follows: 2400, 9600, 19200, 38400, 8N1. Flow control should be set to NONE, emulation to ANSI and the mode should be set to DIRECT TO COMx (x = the available com port). The default is 9600, 8,N,1.

Commands:

The start of string character may be either a * (asterisk) or _ (underscore) character.
The second character of the string is the unit (u) number, 0 to 3.
The third character is the input (i) number, 1 thru 4 or M.
The third character may also be used to save a power up channel when SW6-5 is ON.

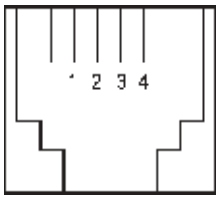
*ui	i = input 1 thru 4 or M to mute the output
_ui	i = Input 1 thru 4 or M to mute the output
*uS	Save current input on power up
_uS	Save current input on power up.

Examples: *04 This string would turn on channel 4 on unit 0
_04 This string would turn on channel 4 on unit 0

STEP 7: SERIAL OPERATION Continued

Serial: Pin out of the RJ-11 modular/(S9) D-Sub adapter is shown below.

RJ-11 Adapter. Pin Number.	DB-9 Female. Pin Number.	Product's point of view Function Name.
4	3	RS-232 Receive
3	2	RS-232 Transmit
2	5	Ground



Modular connectors point of view.

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Remote Control Connector:

The front panel functions are brought out through the rear panel "REMOTE" connector TB 4, providing a means of controlling the SS 4.1 III from a remote point. The digital inputs may be connected to any remote pair of switch contacts, such as external relays, switches, open-collectors or 5-volt logic signals.

Status:

The status signals are supplied through the "Remote" control connector as individual open collectors. The open collectors may be used to provide status to a remote control point to indicate which source is selected. The status output for the selected output will go low, providing a return for an LED indicator, TTL/CMOS logic or relay. External pull-up resistors may be required in some installations.

Rear Panel Connectors

TB 1 --> TB 2 ***EVEN*** **Inputs** **Top Row**

Input x – Left	Input x + Left	Chs Gnd	Input x – Right	Input x + Right
Input x – Left	Input x + Left	Chs Gnd	Input x – Right	Input x + Right

ODD Inputs **Bottom Row**

TB 3 **Output** **Top Row**

Output – Left	Output + Left	Chs Gnd	Output – Right	Output + Right

TB 4 **Open Collector Outputs** **Top Row**

Open Collector 1	Open Collector 2	Open Collector 3	Open Collector 4	Ground	Ground
Input 1	Input 2	Input 3	Input 4	Mute	Step

Remote input selection **Bottom Row**

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SPECIFICATIONS

Inputs/Outputs:	Any input level and impedance can be used. Inputs may be balanced or unbalanced. Output levels, impedance, distortion, noise and balancing will match that of the selected input.
Switching Method:	Passive. Sealed relays utilizing 2-form-C bifurcated-crossbar silver alloy with gold overlay contacts
Logic:	Flash microprocessor, non-volatile memory
Operation Control:	Front Panel - Momentary switches. Remote - Momentary closure to ground or 5 Volt TTL/CMOS Logic levels. Serial - RS-232c, 6P4C reversed modular cable with 9- pin (S9) D-Sub adapter, 2400, 9600, 19200, 38400 / 8,N,1
Status:	Front Panel - Indicator LED. Remote - Open collector outputs, 12 vdc, limit current to 50ma per output. Pull-ups may be required.
Interfacing:	Audio& Remote Control - Pluggable screw terminals (Euro). RS-232 - 4C6P Modular. All mating connectors, reversed modular cable and (S9) adapter supplied.
Power Requirements:	9 Vac, 1 amp. 120 Vac 50-60 hz transformer. (CE 240 Vac 50-60 Hz optional)
Physical Dimensions:	5.50” x 6.50” x 1.55” (WDH)
Weight:	2.0 lb.

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